Amendments to the Specification

Please replace the paragraph beginning at page 3, line 21, with the following re-written paragraph:

a1

A light engine having an LCOS imager has a severe non-linearity in the display transfer function, which can be corrected by a digital lookup table, referred to as a gamma table. The gamma table corrects for the differences in gain in the transfer function. Notwithstanding this correction, the strong non-linearity of the LCOS imaging transfer function for a normally white LCOS imager means that dark areas have a very low light-versus-voltage gain. Thus, at lower brightness levels, adjacent pixels that are only moderately different in brightness need to be driven by very different voltage levels. This produces a fringing electrical field having a component orthogonal to the desired field. This orthogonal field produces a brighter than desired pixel, which in turn can produce undesired bright edges on objects. The presence of such orthogonal fields is denoted ~~declination~~ disclination. The image artifact caused by ~~declination~~ disclination and perceived by the viewer is denoted sparkle. The areas of the picture in which ~~declination~~ disclination occurs appear to have sparkles of light over the underlying image. In effect, dark pixels affected by ~~declination~~ disclination are too bright, often five times as bright as they should be. Sparkle comes in red, green and blue colors, for each color produced by the imagers. However, the green sparkle is the most evident when the problem occurs. Accordingly, the image artifact caused by ~~declination~~ disclination is also referred to as the green sparkle problem.

Please replace the paragraph beginning at page 4, line 12, with the following re-written paragraph:

a2

LCOS imaging is a new technology and green sparkle caused by ~~declination~~ disclination is a new kind of problem. Various proposed solutions by others include signal processing the entire luminance component of the picture, and in so doing, degrade the quality of the entire picture. The trade-off for reducing ~~declination~~ disclination and the resulting sparkle is a picture with virtually no horizontal sharpness at all. Picture detail and sharpness simply cannot be sacrificed in that fashion.

Please replace the paragraph beginning at page 4, line 20, with the following re-written paragraph:

a3

One skilled in the art would expect the sparkle artifact problem attributed to ~~declination~~ disclination to be addressed and ultimately solved in the imager as that is where the ~~declination~~ disclination occurs. However, in an emerging technology such as LCOS, there simply isn't an opportunity for parties other than the manufacturer of the LCOS imagers to fix the problem in the imagers. Moreover, there is no indication that an imager-based solution would be applicable to all LCOS imagers. Accordingly, there is an urgent need to provide a solution to this problem that can be implemented without modifying the LCOS imagers.

Please replace the paragraph beginning at page 5, line 1, with the following re-written paragraph:

a4

The inventive arrangements taught herein solve the problem of sparkle in liquid crystal imagers attributed to ~~declination~~ disclination without degrading the high definition sharpness of the resulting display. Moreover, and absent an opportunity to address the problem by modification of imagers, the inventive arrangements advantageously solve the sparkle problem by modifying the video signal to be displayed, thus advantageously presenting a solution that can be applied to all liquid crystal imagers, including LCOS imagers. Any reduction in detail is advantageously and adjustably limited to dark scenes, even very dark scenes. The video signal is signal processed in such a way that higher brightness level information is advantageously unchanged, thus retaining high definition detail. At the same time, the lower brightness levels of the video signal that directly result in sparkle are processed in such a way that the sparkle is advantageously prevented altogether, or at least, is reduced to a level that cannot be perceived by a viewer. The signal processing of the lower brightness level information advantageously does not unacceptably degrade the detail of the high definition display. Moreover, signal processing in the form of slew rate limiting can advantageously be adjusted or calibrated in accordance with the non-linear gain of any gamma table, and thus, can be used with and adjustably fine tuned for different imagers in different video systems.

Please replace the paragraph beginning at page 6, line 32, with the following re-written paragraph:

a5

In each embodiment, the sparkle reduction processing changes the brightness levels of the pixels in the lowest brightness levels, corresponding to the highest gain portion of the gamma table, in such a way as to reduce the occurrence of ~~declination~~ disclination in the LCOS imager. A threshold for the luminance signal decomposer, for example, can be expressed as a digital fraction, for example a digital value of 60 out of a range of 255 digital steps (60/255), as would be present in an 8-bit signal. The threshold can also be expressed in IRE, which ranges from 0 to 100 in value, 100 IRE representing maximum brightness. The IRE level can be calculated by multiplying the digital fraction by 100. The IRE scale is a convenient way to normalize and compare brightness levels between signals having different numbers of bits. The value of 60, for example, corresponds approximately to 24 IRE. In a presently preferred embodiment, the threshold value for the luminance decomposer is 8, corresponding to approximately 3.1 IRE.

Please replace the paragraph beginning at page 9, line 1, with the following re-written paragraph:

a6

A circuit for reducing sparkle artifacts attributed to ~~declination~~ disclination errors in liquid crystal video systems, for example LCOS video systems, is shown in Figure 1 and generally denoted by reference numeral 10. The circuit comprises a decomposer 12, a slew rate limiter 22, a delay match circuit 24 and an algebraic unit 26. An input video signal X, for example a luminance signal or a video drive signal, is modified by the circuit 10, and in response, an output video signal X' is generated. The video signal is a digital signal, and the waveform is a succession of digital samples representing brightness levels. The output signal X' has a similar digital format. The decomposer 12

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generates a higher brightness level signal 20 and a lower brightness level signal 18. The operation of decomposer 12 is illustrated in Figure 2.